Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matters of	)	
	)	
Deployment of Wireline Services Offering Advanced Telecommunications Capability	)	CC Docket No. 98-147
	)	
and	)	
	)	
Implementation of the Local Competition Provisions of the Telecommunications Act of 1996	)	CC Docket No. 96-98

COMMENTS OF MPOWER COMMUNICATIONS CORP.

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SUMMARY

The deployment of fiber-based networks by incumbent local exchange carriers provides much promise for both incumbents and competitors alike in regard to the development of a wide array of services. The Commission must ensure, however, that competitive local exchange carriers are able to partake of the advantages these networks provide and not be foreclosed from access to the next generation loop architecture. The Commission has taken a laudable step in this direction by specifying in its *Line Sharing Reconsideration Order* that the line sharing requirement applies to the entire loop, including where the ILEC has deployed fiber in the loop.

The Commission has rightly recognized, however, that there are still many implementation issues that need to be addressed both in the line sharing context, and regarding CLEC access to next generation loop architecture in general. Mpower strongly urges the Commission to establish requirements that provide CLECs unbundled access to all next generation network loop architectures and that give CLECs full access to advanced technologies deployed by ILECs. This unbundled access should provide the CLEC with unbundled end-to-end access from the central office to the customer regardless of the intervening loop makeup. This unbundled access should permit access to the entire path of the fiber loop on the same basis the ILEC provides access to itself. The Commission should designate new fiber unbundled network elements ("UNEs") using a functional model as opposed to traditional UNE designations that are tied to specific equipment. The importance of this will soon be seen as ILECs will deploy different forms of next generation networks that may not follow the Project Pronto next generation digital loop carrier architecture which has garnered so much attention in this proceeding. Mpower's proposed fiber UNEs will ensure not only that CLECs will be able to maintain competitive access to an incumbent's network, but also that the nature of this access will not vary based on the particular

technology deployed.

Mpower also urges the Commission to implement line sharing over fiber loops in the most efficient, technically feasible manner, including methods that provide shared access over the fiber feeder portion of the loop. The other alternatives suggested by the Commission such as collocation of DSLAMs at remote terminals should be offered as a choice to CLECs, but not as a requirement, because in many cases such alternatives may be cost-prohibitive or not feasible given space constraints at the remote terminal. All-copper loops also do not provide CLECs with a competitive alternative as they do not provide the transmission speeds that fiber loops provide, and may expose CLECs to material degradation in service quality. In addition, the availability of all copper loops is likely to diminish with the increased ILEC deployment of fiber loops.

Some ILECs may raise certain objections to line sharing over fiber loops. One such objection will be the claim that the ILEC does not use the same fiber for transmission of voice and data traffic. This network configuration is dictated by ILEC choice, however, as it is technically feasible and more efficient for one fiber to concurrently carry both voice and data from the remote terminal to the central office. The Commission should not allow network designs that utilize separate fiber paths for voice and data to be excluded from the unbundling obligations set by the Act.

Some ILECs may also invoke the claim that since the next generation loop architecture includes packet switching such loops should not be unbundled. The conditions for the unbundling of packet switching, however, are satisfied in regard to next generation loops. Rather than counseling against unbundling, the nature of the next generation loop architecture, and the packet switching functionality contained in such architecture, strengthen the case for unbundling.

The Commission should not only implement requirements that will facilitate line sharing

over fiber loops, but that will facilitate CLEC access to next generation loop architecture in general.

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Mpower Communications Corp. ("Mpower") submits these comments in response to the Commission's notices of proposed rulemaking[1] in the above-captioned proceedings concerning the need to revise the Commission's local competition rules with respect to line sharing where an incumbent local exchange carrier ("ILEC") has deployed fiber in the loop. These comments provide recommendations to the Commission concerning principles for resolution of issues concerning line sharing and CLEC access to loops (including those in which fiber is deployed and DSL systems are placed outside the central office). Implementation of these principles will accelerate achievement of the competitive goals of the Act.

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[1] *Deployment of Wireline Services Offering Advanced Telecommunications Capability and Implementation of the Local Competition Provisions of the Telecommunications Act of 1996*, CC Docket Nos. 98-147, 96-98, Third Report and Order on Reconsideration and Third Further Notice of Proposed Rulemaking in CC Docket No. 98-147, and Fourth Report and Order on Reconsideration and Sixth Further Notice of Proposed Rulemaking in CC Docket No. 96-98, FCC 01-26 (January 19, 2001) ("*Line Sharing Recon. Order & FNPRM*").

I. THE COMMISSION SHOULD DEFINE NEW FIBER UNES.

Mpower supports the Commission's clarification that the requirement to provide line sharing applies to the entire loop, including access to the fiber portion of the loop where ILECs have deployed next generation architectures such as those that place DSL equipment outside the central office. These models include installing Next Generation Digital Loop Carrier ("NGDLC") systems that extend fiber from the central office to the remote terminal ("NGDLC loops" or "NGDLC loop architecture").[2] The focus in these comments on NGDLC architectures such as those deployed by SBC Communications in its "Project Pronto" architecture is illustrative only. The principles articulated in these Comments should also be applied to other architectures such as those that utilize the placement of stand-alone DSLAMs in remote terminals or at feeder distribution interfaces.

In its comments filed on October 12, 2000, in this proceeding, Mpower urged the Commission to designate new fiber-based unbundled network elements ("UNEs") using a functional model. That functional model is better suited for rapidly evolving next generation loop architecture than the traditional UNE designations that are directly tied to specific equipment.[3] Mpower continues to advocate this functional model approach to the designation of new fiber-based UNEs and urges the Commission to consider designating additional fiber-based UNEs as described in Mpower's October 12, 2000 Comments. A brief summary of the specific fiber-based UNEs requested by Mpower is set forth in Attachment A to these comments. Mpower also

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[2] *Line Sharing Recon. Order & FNPRM* at ¶¶ 10-13.

[3] *Deployment of Wireline Services Offering Advanced Telecommunications Services*, CC Docket No. 98-147 and 96-98, Comments of Mpower Communications Corp. filed October 12, 2000, at 48-57.

provides in Attachment B an impairment analysis for unbundling next generation loops that supports the designations of fiber-based UNEs articulated in Attachment A. Mpower would also like to draw the Commission's attention to an order issued recently by the Illinois Commerce Commission ("ICC").[4] The Illinois Commerce Commission conducted an exhaustive proceeding that addressed many of the issues raised by the Commission in its *FNPRM*. The Illinois Commerce Commission reached the following conclusions:

> [T]his proceeding had compiled a thorough analysis of the FCC's *Project Pronto Order* and concludes the following: a) the FCC's *Project Pronto Order* does not preempt, or otherwise prevent, this Commission from ordering line sharing over the Project Pronto architecture or identifying Project Pronto components as UNEs; b) it is technically feasible to unbundle the elements of the Project Pronto architecture; c) line sharing over the Project Pronto architecture is technically feasible; d) Project Pronto unbundling is not precluded by the FCC's exception to unbundled packet switching; e) the appropriate analysis in this case is the "impair" standard because no claim has been made that the Project Pronto architecture or its components are proprietary; f) line sharing over Project Pronto, and the unbundling of the Project Pronto network, satisfy the "impair" standard; g) the Project Pronto network should be unbundled and its elements offered to CLECs at just and reasonable rates as UNEs; h) Ameritech-IL must allow CLECs to virtually collocate line cards at RTs with NGDLCs, including RTs in the Project Pronto network; and I) the FCC has recently confirmed that nothing in the Line Sharing Order should be read as precluding a state commission from ordering line sharing over a system in which fiber has been deployed.[5]

Mpower urges the Commission to designate new unbundled network elements as the ICC did. Such Commission action will ensure competitive access to the next generation loop architectures deployed by ILECs.

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[4] *Petitions for Arbitration Pursuant to Section 252(b) of the Telecommunications Act of 1996 to Establish an Amendment for Line Sharing to the Interconnection Agreement with Illinois Bell Telephone Company d/b/a Ameritech Illinois, and for an Expedited Arbitration Award on Certain Core Issues*, ICC Docket Nos. 00-0312 and 00-313, Arbitration Decision on Rehearing (Feb. 15, 2001) ("*IL Order*")

[5] *IL Order* at 30.

II. IMPLEMENATION OF LINE SHARING OVER FIBER

Mpower believes that CLECs should be able to implement line sharing over NGDLC[6] loops in the most efficient, technically feasible manner, including methods that provide shared access over the fiber feeder portion of the loop from the central office. Other alternatives, such as those that require collocation at the remote terminal, should be an option, but not a requirement, for CLECs that wish to obtain line sharing over NGDLC loops. In the following subsections, Mpower addresses specific issues pertaining to the implementation of line sharing over fiber.

A. Collocation of DSLAMs at the Remote Terminal Is Not An Adequate Solution for Line Sharing Over Fiber Loops.

The *FNPRM* requests comments on CLECs' collocation of DSLAMs at remote terminals as an option for obtaining access to the line-shared loop in light of the current availability as UNEs of subloops and dark fiber.[7] Mpower agrees that collocation at remote terminals should be an option for CLECs for reasons Mpower has previously stated in this proceeding.[8] Such collocation by itself, however, is not an adequate implementation of line sharing over fiber loops for several reasons.

First, collocating DSLAMs at remote terminals essentially requires a CLEC to reproduce the loop facility on a piecemeal basis. CLECs would have to collocate their equipment in a vast number of remote terminals served by fiber. CLECs would have to make all the necessary cross

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6 The nomenclature used in these Comments, *i.e.*, NGDLC systems, which is primarily associated with SBC's Project Pronto architecture is not intended to preclude application of the principles advocated in these Comments to other network architecture models. Among those models would be stand-alone DSLAMs, multiplexed copper feeder systems or placement of DSLAMs at plant locations other than the remote terminal, such as the feeder distribution interface.

7 *Line Sharing Recon. Order & FNPRM* at ¶ 56-57.

8 Mpower's Oct. 12, 2000 Comments at 33-35.

connections at each remote terminal between the end user's copper and the CLEC's collocated equipment. CLECs would also have to lease dark fiber from the ILEC at each remote terminal and connect that dark fiber with their collocated optical equipment. Provisioning these arrangements would be costly and time consuming.[9] In fact, the FCC has specifically recognized that collocation of DSLAMs in an ILEC's remote terminals is far more costly than accessing these loops from the central office.[10] These same considerations were the main reason the Commission required unbundling of dedicated transport.[11] In fact, when the FCC ordered the unbundling of interoffice transport, it relied upon the Commission's determination that "collocating in each end office imposes materially greater costs on requesting carriers than purchasing the incumbent's interoffice transport facilities."[12] These considerations are equally applicable here and require a finding that collocation at the remote terminal is not an adequate method for making line sharing available on next generation loops such as those supporting remote DSL functionality via NGDLC or DSLAM systems. Remote terminal collocation should be an option, but not the only option.

Second, remote terminal collocation is inadequate because dark fiber is available only on a limited basis, and access is not available at every remote terminal. Collocation in remote

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9 *Line Sharing Recon. Order & FNPRM* at ¶ 13.

10 *Line Sharing Recon. Order & FNPRM* at ¶ 13. The ICC found that collocation of DSLAMs in remote terminals is a "costly alternative that will not be uniformly available in every RT." The ICC found such collocation is "limited by space constraints, is quite expensive (and may even be uneconomic in many or most RT locations), and takes considerable time to deploy" making it an inadequate substitute for unbundled access to the Project Pronto architecture. *IL Order* at 34.

11 *See Implementation of the Local Competition Provisions of the Telecommunications Act of 1996*, CC Docket No. 96-98, Third Report and Order, 15 FCC Rcd. 3696, ¶¶ 357, 363 (1999) ("*UNE Remand Order"*).

12 *UNE Remand Order* at ¶357.

terminals impairs a requesting carrier's ability to offer services that traverse a fiber feeder over broad geographic areas. These limitations will impede a CLEC's ability to deploy an alternative network that allows transmission of voice and data services over a fiber-fed network that is similar to that of an ILEC. Even in those locations where dark fiber is available at a remote terminal, collocation space is likely to be constrained. Moreover, there are significant concerns regarding the availability, pricing and transmission quality of dark fiber, which limit the viability of dark fiber as an alternative.

Third, leasing dark fiber is an inefficient means for a CLEC to obtain a transmission path from the remote terminal to the central office. In designating shared transport as a UNE, the Commission reasoned that the facilities would be "shared among many users" including the ILEC's end users, "thereby reducing requesting carrier costs and utilizing capacity only when necessary to route and complete a call."[13] These same efficiency considerations apply to the use of dark fiber as part of a line sharing alternative for CLECs. Rather than requiring CLECs to lease dark fiber to access line sharing, they should be allowed to access the same fiber portion of the loop used by the ILEC.

In light of the above considerations, Mpower believes that collocation of DSLAMs at the remote terminal should be only one of the multiple options available to CLECs to access line sharing on next generation loops. As discussed above, these options are not ubiquitously available and, when available, may be prohibitively costly and time consuming. Mpower urges the Commission to view these options as part of an overall line sharing regime in which the goal is to give CLECs a form of access to ILEC network elements that would realistically allow them to

provision advanced services out of remote terminals.

B. Migration of CLEC Customers to All-Copper Loops is Not a Viable Alternative to Competitive Access to NGDSL Loops.

1. Sharing of Fiber Feeder is Technically Feasible and Should be Made Available to CLECs as a New UNE

The *FNPRM* requests comment on unbundled access to shared fiber feeder.[14] The FCC should first recognize that it is technically feasible for competitors and incumbents to share the fiber feeder from the remote terminal to the central office. For example, in the Illinois proceeding, SBC stated that this is technically feasible, and the ICC found that line sharing over a single fiber is technically feasible.[15] When fiber is shared, however, voice and data transmission paths will not occupy a single end-to-end transmission path through this architecture with a consistent interface at each end. Instead, transmission paths will be configured as virtual channels.

Importantly, the FCC's definition of the loop contemplates advanced technology that may be used to provide xDSL services. As the FCC recently stated in its *Line Sharing Recon. Order and FNPRM*, the local loop definition is "technology-neutral."[16] Accordingly, the definition is not limited to any particular technologies and includes transmission technologies that utilize virtual paths. Virtual paths are types of paths enabled by ATM based technology (packet switching paths) compared to other types of virtual channels provided by DWDM and other network

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13 *UNE Remand Order* at ¶ 375.

14 *Line Sharing Recon. Order & FNPRM at ¶ 60-61*.

15 *IL Order* at 32-33.

16 *Line Sharing Recon. Order & FNPRM* at 10.

systems.[17] Therefore, such shared fiber facilities should be made available to CLECs on an unbundled basis.

The *FNPRM* asks whether shared access to fiber feeder is more similar to shared transport than the loop.[18] Although access to such network facilities may, in some degree, appear similar, Mpower recommends that the Commission designate such access as a new UNE rather than attempt to fit it into the existing definition of shared transport. As the Commission recognizes, a definition of shared access for fiber feeder would require the remote terminal to be treated as an end office. This is a cumbersome approach and ignores the reality that fiber feeder is an integral part of the local loop. Defining such access as shared transport could have the effect of denying CLECs shared access to the fiber feeder. Also, because this approach is inconsistent with the Commission's historical treatment of shared transport as an interoffice transmission facility, it could have unintended consequences and undercut Commission rules regarding shared transport in ways that are not readily apparent. For these reasons, the Commission should designate access to fiber feeder as a new UNE pursuant to the normal impairment analysis and require that ILECs make it available wherever and whenever such facilities are deployed.[19] In Attachment B,

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[17] *Line Sharing Recon. Order & FNPRM* at 10. Dense wave division multiplexing ("DWDM") technology, multiplies the capacity of an optical fiber by simultaneously operating at more than one wavelength, thereby allowing multiple information streams to be transmitted simultaneously over the fiber. *In the Matters of Deployment of Wireline Services Offering Advanced Telecommunications Capability and Implementation of the Local Competition Provisions of the Telecommunications Act of 1996,* CC Docket Nos. 98-147, 96-98, Order on Reconsideration and Second Further Notice of Proposed Rulemaking in CC Docket No. 98-147, and Fifth Further Notice of Proposed Rulemaking in CC Docket No. 96-98, FCC 00-297, ¶ 120, n. 253 (August 10, 2000) ("*Collocation Reconsideration Order and NPRM*").

[18] *Line Sharing Recon. Order & FNPRM* at ¶ 62.

[19] *See also UNE Remand Order* at ¶ 366 (requiring that shared transport be made available on an unconditional and uniform unbundled basis because the benefits of uniform transport unbundling outweigh the costs of creating a patchwork regime in which ILECs would likely seek to litigate its transport obligations on

(con't.)

Mpower provides an impairment analysis that demonstrates that NGDLC network architecture should be fully unbundled.

2. All-copper loops do not provide CLECs with a competitive alternative.

The *FNPRM* requests comments on whether it is viable for ILECs to migrate a customer served by the DLC onto an all-copper loop where a CLEC is unable to collocate its equipment in the remote terminal.[20] Mpower believes that the use of all-copper loops is often not a viable alternative to unbundled access to ILECs' next generation loops. As a threshold matter, ILECs generally deploy DLC systems to accommodate for growth where distances are too great to be served efficiently by all copper loops. If CLECs are forced to migrate to an all-copper loop, their xDSL transmission speeds will be lower than the xDSL speeds provisioned over fiber from the feeder. As a result, a CLEC's service over an all-copper loop cannot be considered a comparable substitute or alternative to the services offered over next generation loops.

Lack of unbundled access to ILEC's next generation loops would also expose CLECs to material degradation in service quality associated with using copper. The fiber-fed NGDLC systems at the remote terminal may sometimes cause cross talk interference problems on the copper based loops serviced by DSLAMs collocated in the central office.[21] This degradation will materially diminish a competitor's ability to provide service. In fact, during a hearing on this issue

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particular point-to-point routes). As the FCC stated in the *UNE Remand Order* which also applies here, uniform unbundling requirements provide certainty in the market that "will allow new entrants and fledgling competitors to implement national and regional business plans and attract capital investment." *Id.* A patchwork or ad hoc unbundling regime only serves to foster litigation over the ILECs unbundling obligations which requires state commissions to expend vast amounts of time and resources thereby impeding the development of competition. *Id*

20 *Line Sharing Recon. Order & FNPRM* at 58.

21 *IL Order* at 35.

before the Illinois Commerce Commission, Ameritech's witness acknowledged that there could be a degradation in throughput because of Project Pronto's deployed architecture. [22] If CLECs have unbundled access to the same next generation loop architecture, the potential degradation of CLECs loops will be at least minimized if not avoided entirely.

Finally, an all-copper migration alternative is also inadequate because the availability of all-copper loops will likely diminish as ILECs continue to deploy next generation loop architectures. Because fiber is less expensive to maintain than copper, ILECs will sometimes choose to retire "home run" copper feeder that is no longer economical to maintain. As a result, CLECs could be denied competitive access to a large and growing number of customers. As the ICC noted:

> SBC has made only very short-term commitments that home run copper will continue to be available as a means of line sharing. Should Ameritech IL begin to phase out its copper loops, and continue to refuse line sharing over its Project Pronto network, Ameritech IL could effectively bar all other providers from large segments of the potential market for xDSL based services.[23]

In light of the problems that surround the use of all-copper loops, it is essential for CLECs to have access to evolving ILEC network mediums and technologies so that they may plan their businesses and construct their networks in a manner that realistically attracts the necessary network investment that is crucial to entering the marketplace. Mpower recommends that the Commission reject this alternative and focus instead on how to provide CLECs with reasonable access to loops that include fiber.

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[22] *Id.*

[23] *Id.* The record in this proceeding has demonstrated that other ILECs have taken similar positions to the retirement of copper loops to the position SBC has taken.

3. A Project Pronto-Type Fiber-Fed NGDLC Network Architecture is an Alternative to All-Copper Migration

The *FNPRM* requests comment on access to ILEC NGDLC network architecture that utilizes two fiber paths to provision line sharing that is similar to SBC's Project Pronto network design.[24] The FCC should recognize that NGDLC loops that utilize two fiber paths for voice and data traffic should be accessible to CLECs so that they may offer line sharing to customers served by such loops. Regardless of the architecture of these loops, it is technically feasible to offer end users voice service and ADSL service, over the same subloop accessing the customer premises, whether provided by the same carrier or two different carriers.

In the *Line Sharing Recon. Order*, the FCC explained that the "requirement to provide line sharing applies to the entire loop, even where the incumbent has deployed fiber in the loop (*e.g.*, where the loop is served by equipment at a remote terminal)."[25] It also clarified that "[w]hen we concluded in the *Line Sharing Order* that incumbents must provide unbundled access to the high frequency portion of the loop at the remote terminal as well as the central office, we did not intend to limit competitive LECs' access to fiber feeder subloops for line sharing."[26] As the FCC observed:

> [I]f our conclusion in the *Line Sharing Order* that incumbents must provide access to the high frequency portion of the loop at the remote terminal as well as the central office is to have any meaning, then competitive LECs must have the option to access the loop at either location, not the one that the incumbent chooses as a result of network upgrades entirely under its control. This approach is

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24 *Line Sharing Recon. Order & FNPRM* at ¶ 59.

25 *Line Sharing Recon. Order & FNPRM* at ¶ 10.

26 *Id.*

> consistent with the dual goals expressed in the *Line Sharing Order* of allowing incumbents to deploy whatever network architecture they deem to be most efficient, while also requiring them to engage in good faith negotiations regarding their unbundling obligations.[27]

In addition, the FCC noted with regard to the increasing deployment of fiber in incumbent LECs' networks that:

> [A]ll indications are that fiber deployment by incumbent LECs is increasing, and that collocation by competitive LECs at remote terminals is likely to be costly, time consuming, and often unavailable. We provide this clarification because we find that it would be inconsistent with the intent of the *Line Sharing Order* and the statutory goals behind sections 706 and 251 of the Act to permit the increased deployment of fiber-based networks by incumbent LECs to unduly limit the competitive provision of xDSL services.[28]

An ILEC's NGDLC network architecture that utilizes separate fibers for voice and data traffic from the remote terminal to the central office should not prevent the ILEC from having to unbundle the loop for line sharing. As the FCC is aware, voice and xDSL service will share the same copper line from the customer's perspective.[29] Moreover, it is technically feasible and more efficient for one fiber to concurrently carry both voice and data traffic from the remote to the central office.[30]

The FCC should recognize that the network architecture and associated network elements used to give CLECs access to line sharing, whether an ILEC uses one fiber or two in its NGDLC

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27 *Id.* at ¶ 11.

28 *Id.* at ¶ 13.

29 *See also IL Order* at 33.

30 *See IL Order* at 33.

network architecture, should not exempt it from unbundling obligations.[31] As stated above, one of the places at which the FCC requires incumbents to provide unbundled access to the high frequency portion of the loop ("HFPL") is the central office.[32] In light of this underlying obligation, it is irrelevant what facilities an ILEC uses in the course of getting the HFPL to the central office. In addition, subloop access should not be a "requirement" instead of a "choice" for CLECs that want to compete effectively with ILECs. This is so because home run copper feeders are generally not capable of providing an equivalent high speed xDSL transmission that a fiber-fed NGDLC network architecture can offer. Consequently, absent this choice, CLEC competition is impeded rather than fostered when CLECs have no option but to deploy duplicate facilities deep into the ILEC's network. CLECs cannot compete on the same footing with ILECs that have deployed fiber networks if they are forced to duplicate them. Moreover, such an outcome contravenes the main reason for unbundling line sharing which is to spur local competition and the roll out of advanced services in the small business and residential marketplace.

ILECs are required to provide access to the HFPL portion of the loop, regardless of whether the loop is all copper or served with fiber feeder. The FCC has established this ILEC obligation and NGDLC network designs that utilize separate fiber paths for voice and data should not frustrate unbundling requirements here.

C. Facilities-Based CLECs Must Have Non-Discriminatory Access to Packet Switching

The *FNPRM* also seeks comment on unbundling packet switching that is provisioned

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31 *See also Line Sharing Recon. & FNPRM* at ¶ 13 ; *IL Order* at p. 33.*;*

within an NGDLC loop.[33] The next generation loop architecture includes the functionality of the OCD (which is an ATM switch) that is deeply embedded in NGDLC loop architecture. The unbundling of this entrenched switching functionality is justified and required by the *UNE Remand Order*. Specifically, the FCC requires ILECs to unbundle packet switching when the following conditions are met: (1) the ILEC has installed DLC systems; (2) there are no spare copper loops that are capable of supporting the xDSL services the CLEC seeks to offer; (3) requesting CLECs are not allowed or able to collocate DSLAMs at ILEC remote terminals; and (4) the ILEC has deployed packet switching for its own use.[34]

When an ILEC deploys next generation loops all four conditions referenced above will generally be present,[35] and access via the OCD (ATM switch) must be made available as a UNE.[36] The first condition will always be present if the ILEC deploys NGDLC loops. The second condition will be present because, as established above, "home run" copper loops will not always be available. This is particularly true of spare copper loops capable of supporting xDSL services without interference or degradations.[37] The third condition will be present in most instances because CLECs, due to ILEC space limitations, will be unable to collocate in the remote terminal

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32 *See* 47 C.F.R. § 51.319(h)(6); *Line Sharing Order* at ¶ 91; *Line Sharing Reconsideration Order at* ¶ 11.

33 *Line Sharing Recon. Order & FNPRM* at ¶¶ 62-63.

34 *UNE Remand Order*, at ¶ 313; 47 C.F.R. 51.319(c)(3).

35 Packet switching should be made available on an unbundled basis for all next generation network architectures.

36 *IL Order* at 32.

37 *See also IL Order* at 30-32.

on the same terms as the ILEC.[38] As a result, collocating near the remote terminal is insufficient because the collocation offering itself is inferior to what the ILEC provisions to itself. The FCC has recognized that such a comparison must be the focus of this analysis.[39] Finally, the fourth condition will always be met because ILECs will deploy NGDLCs not only to capitalize on the demand for advanced services but also to minimize network costs.[40]

Furthermore, the most important finding on packet switching in the *UNE Remand Order* is its conclusion that competitors may be impaired as a result of the lack of access to packet switching required to provide xDSL services to small business and residential consumers served by NGDLC loops. Stressing that its regulations must adapt to changing market and technological developments, the *UNE Remand Order* states that the Commission has the authority to unbundle packet switching if it determines that lack of unbundled access to the incumbent's packet switching network element would impair CLECs' ability to provide the services they seek to offer.[41]

D. CLECS Should Be Permitted to Deploy Their Own Line Cards.

In the *FNPRM*, the Commission asked whether for the purpose of line sharing, a CLEC

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38 *See also IL Order* at 32.

39 *UNE Remand Order* at ¶ 313. The FCC stated that if the ILEC and CLEC cannot access the remote terminal on equal terms then the ILEC "can effectively deny competitors entry into the packet switching market." *Id.*

40 *See, e.g., SBC Announces Sweeping Broadband Initiative,* SBC Investor Briefing, Oct. 18, 1999 at 2 (stating that the "network efficiency improvements alone will pay for SBC's Project Pronto initiative."); *see also Strong Data, Wireless and Long-Distance Operations Highlight SBC's Third-Quarter Results,* SBC Investor Briefing, Oct. 23, 2000 at 4; *IL Order* at p. 35 (finding that SBC's project Pronto deployment is to "generate significant savings in maintenance costs and to increase the ability of its data affiliates to serve customers with xDSL service").

41 *UNE Remand Order* at ¶ 312.

can physically or virtually collocate its line card at the remote terminal by installing it in the ILEC's remote DSL system.[42] Mpower agrees that, where technically feasible, CLECs should be allowed to collocate their own line cards at the remote terminal. The terms of such remote terminal collocation will need to address issues regarding use of the ILEC's shelf, electronics, and transport, as well as interoperability issues. These issues can and should be resolved in a manner that allows CLECs to collocate their own line cards at the remote terminal so that this option is available to CLECs.[43]

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[42] *Line Sharing Recon. Order & FNPRM* at ¶ 56.

[43] The ICC determined that collocation of a line card at the remote terminal "constitutes permissible interconnection at a technically feasible point in the ILEC's network under Section 251 of the Act." *IL Order* at p. 31.

III. CONCLUSION

For the foregoing reasons, the Commission should adopt the policies and requirements urged by Mpower.

Respectfully submitted,

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Attachment A

Summary of Fiber Based UNEs Proposed By Mpower

1. ATM Over Fiber UNE

The ATM over Fiber UNE is vital to CLECs as it provides unbundled access to the ATM packet transmission system that serves nearly all remote DSL systems deployed today. The ATM over Fiber UNE refers to the provision of ATM functionality over the transmission or feeder segment between the CO and the RT. This element of the network consists of multiplexing equipment at the RT, the fiber optic cable facilities between the RT and the CO, and the multiplexing and switching equipment at the CO (the Optical Concentration Device or OCD). Data is transmitted through one or more virtual circuits that can be assigned a variety of different quality of service ("QoS") levels.

There are two aspects to unbundling this element. First, the path from the line card to the OCD must be unbundled to complete the transmission path from the customer to the central office. A virtual circuit is necessary to the provision of DSL services. The facility used is the fiber feeder loop, but the method of usage will be "virtual circuits" that create logical paths that use the OCD for routing and switching. This is similar to the way traditional electronics are used to create specific transport paths on a particular fiber facility.

The second aspect of unbundling this UNE deals with the features, functions and capabilities that are provided by the UNE through the QoS classes. Different QoS classes are necessary to support new and innovative services such as streaming video, application services, and other advanced services. CLECs need the features, functions and capabilities provided by the QoS classes. For example, with constant bit rate ("CBR"), bits are conveyed regularly in time and

at a constant rate. CBR is particularly important in sending uncompressed voice and video traffic because these are sensitive to variable delay; thus, they must be transported without any interruptions in the flow of data. Other necessary QoS ATM options that should be made available include variable bit rate real-time and non-real-time. Whatever technology and QoS support the ILECs choose to employ, ILECs should be required to offer the same options to CLECs on an unbundled basis. It is worth noting that without the full range of QoS options, CLECs and ILECs alike will be severely limited in their choice of service offerings that they provide to their customers. For example, multiple QoS types are necessary to support VoDSL service.

Significantly, the ATM over Fiber UNE is often readily available in ILECs' networks without the need for installing additional equipment. Mpower recommends that the Commission designate ATM over Fiber as a UNE that must be provided in the manner reflected in these Comments. Although other ILECs and CLECs should be able to reach similar agreements on a voluntary basis, in light of past disagreements[44] the Commission could facilitate competitive access to this UNE by specifying the access that is required.

2. Fiber Wavelength UNEs

New optical technologies, including dense wave division multiplexing ("DWDM") technology, present another technology-neutral option for designating a UNE that will significantly enhance CLECs' access to NGDLC loop architecture. These technologies multiply the capacity of an optical fiber by simultaneously operating at more than one wavelength, thereby

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[44] *See* Mpower's October 12, 2000 Comments at 48-49; *Deployment of Wireline Services Offering Advanced Telecommunications Services*, CC Docket No. 98-147 and 96-98, Comments of @Link Networks, Inc., filed October 12, 2000, at 9.

allowing multiple information streams to be transmitted simultaneously over the fiber.[45] DWDM technology permits fiber capacity to be split into separate capacity segments that may be used by different carriers to provide a host of advanced services. As explained in Mpower's October 12, 2000 Comments, the effect of DWDM and other technology on the loop could be revolutionary. Carriers could sell or lease individual streams of light in fiber-optic networks and customers would be able to purchase the amount and type of network bandwidth they want, when they want it.[46]

Designation of optical wavelengths as separate UNEs would be similar to the approach the Commission has already taken in unbundling the electrical high frequency portion of copper loops. Just as the many frequencies of a copper loop make up the total loop "capability,"[47] so too do the wavelengths of a fiber loop or subloop constitute the capabilities that may be separately offered as UNEs As noted above, Mpower is willing to engage in collaborative discussions or other Commission-directed efforts to resolve any issues regarding designation of fiber wavelengths as separate UNEs.

3. Channelized Fiber UNE

The Commission should also consider establishing a UNE based upon the use of TDM (Time Division Multiplexing) technology. As explained in Mpower's October 12, 2000 Comments, this technology should also be readily available without the need for further

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45 *Collocation Reconsideration Order and NPRM* at ¶ 120, n. 253.

46 Mpower's October 12, 2000 Comments at 51-53.

47 *In the Matters of Deployment of Wireline Services Offering Advanced Telecommunications Capability and Implementation of the Local Competition Provisions of the Telecommunications Act of 1996,* CC Docket Nos. 98-147 and 96-98, Third Report and Order in CC Docket No. 98-147 and Fourth Report and Order in CC Docket (con't.)

technology investment by an ILEC.[48] This technology is already used at Remote Terminal locations to deliver POTS service and T1 service, and to provide the backhaul for any UNEs delivered via an NGDLC.

4. Broadband Fiber Loop UNE

This UNE would provide a CLEC use of an integrated loop facility. As explained in Mpower's October 12, 2000 Comments, this UNE would be an extension of the type of Broadband Service Offering now provided by SBC.[49] This UNE should be designed to evolve and adapt to reflect different next generation loop architectures deployed by the ILEC and new product developments that can be used by both ILECs and CLECs. It should also provide for deployment of equipment that gives a CLEC full access to the both existing and future features and functionality of the facility.

5. NGDLC Aggregation UNE

In addition to other UNEs described above, the NGDLC itself may be unbundled so that the aggregating functionality of the NGDLC is available as an element separate from whatever line card happens to be installed to serve a customer. As explained in Mpower's October 12,

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No. 96-98, FCC 99-355, at ¶ 17. ("*Line Sharing Order*").

48 Mpower's October 12, 2000 Comments at 53.

49 Mpower's October 12, 2000 Comments at 53-54.

2000 Comments, this will be necessary to permit CLECs to provide their own line cards.[50] Again, this approach allows the ILEC to select the technology of its choice.

[50] Mpower's October 12, 2000 Comments at 54.

Attachment B

IMPAIRMENT ANALYSIS FOR UNBUNDLING NGDLC LOOPS

With respect to an unbundling analysis under the "impair" standard, the Commission requires unbundling if lack of access to the network element "impairs" a carrier's ability to provide the services it seeks to offer. "A requesting carrier's ability to provide service is 'impaired' if, taking into consideration the availability of alternative elements outside the incumbent LEC's network, including self-provisioning by a requesting carrier or acquiring an alternative from a third-party supplier, lack of access to that element materially diminishes a requesting carrier's ability to provide the services it seeks to offer."[51] The FCC rules establish that the "totality of circumstances" must be considered to determine whether an alternative to the ILEC's network is available in such a manner that a requesting carrier can *realistically* be expected to provide services using the alternative. [52]

If CLECs are not allowed end-to-end unbundled access to ILEC next generation loop networks, CLECs will be realistically foreclosed from offering competitive advanced services. In general terms, CLECs would be required to collocate the equipment necessary to perform the DSLAM and multiplexing functionality along with optical electronics in every ILEC remote terminal served by fiber. In addition, CLECs would need to make all the necessary cross connections at the remote terminal between the end user's copper and its collocated equipment. Moreover, CLECs would need to lease dark fiber (if available) from an ILEC to each remote terminal and to connect that dark fiber to their collocated optical equipment.

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51 47 C.F.R. § 51.317(b).

52 *UNE Remand Order* at ¶ 62.

The ILEC resale offerings such as SBC's wholesale Broadband Service offering[53] are not viable alternatives under the *UNE Remand Order*.[54] In that Order, the FCC stated,

> We assign little weight in our "impair" analysis to the ability of a requesting carrier to use the incumbent LECs' resold or retail tariffed services as alternatives to unbundled network elements. In the *Local Competition First Report and Order*, the Commission expressly rejected the incumbent LECs' argument that requesting carriers are not impaired in their ability to provide service if they can provide their proposed service by purchasing the service at wholesale rates from the incumbent LEC. As the Commission concluded in that Order, allowing incumbent LECs to deny access to unbundled elements solely, or primarily, on the grounds that an element is equivalent to a service available at resale would lead to impractical results; incumbent LECs could completely avoid section 251(c)(3)'s unbundling obligations by offering unbundled elements to end users as retail services. In other words, denying access to unbundled elements on the grounds that an incumbent LEC offers an equivalent retail service could force requesting carriers to purchase, for example, an unbundled loop and switching out of an incumbent's retail tariff at a wholesale discount, subject to all of the associated tariff restrictions. [55]

The FCC further explained in the *UNE Remand Order* that general offerings, such as SBC's wholesale offering, are not viable alternatives to the incumbent LEC's unbundled network element because "competitors would have no assurance that the incumbent LEC would not change the [offering] in such a manner that the competitive LEC could no longer rely on it to

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53 *Applications of Ameritech Corp., Transferor, and SBC Communications Inc., Transferee, For Consent to Transfer Control of Corporations holding Commission Licenses and Lines Pursuant to Sections 214 and 310(d) of the Communications Act and Parts 5,22,24,25,63,90,95 and 101 of the Commission's Rules*, CC Docket No. 98-141, Memorandum Opinion and Order, FCC 99-279 (rel. Oct. 8, 1999)("*SBC/Ameritech Merger Order*"); Second Memorandum Opinion and Order, FCC 00-336, Appendix A (rel. Sept. 8, 2000) ("*Project Pronto Order*"). .

54 The ICC found that "Ameritech IL's wholesale broadband service offering is not an adequate substitute for access to the Project Pronto network elements as UNEs." *IL Order* at p. 34.

55 *UNE Remand Order* at ¶ 67 (internal footnotes and citations omitted).

provide the services it seeks to offer."[56] Indeed, this offering is mandated pursuant to the SBC merger conditions that are expected to sunset the later of April 8, 2003 or 36 months after SBC ceases to process trouble reports of its advanced services affiliate on an exclusive basis.[57] SBC's offering may change at that time and in a manner that precludes CLECs from providing the wholesale broadband services they may be offering at that time. Moreover, pursuant to the terms of SBC's wholesale Broadband Service offering, SBC has the unilateral right to terminate the offering, as a result of any regulatory developments, even after an agreement has been signed (including, perhaps, the recent *D.C. Circuit Decision*[58] that vacated the FCC's Order approving the merger with conditions that prompted SBC to offer its wholesale Broadband Service to CLECs).

Even more troubling is that SBC's offering is not subject to sections 251 and 252 of the Act.[59] This means that CLECs do not have the protections of sections 251 and 252 of the Act should they subscribe to it. For instance, CLECs could not arbitrate regarding provisioning issues associated with this offering under 252 of the Act.[60] A CLEC's subscription to this offering is, therefore, a major gamble. For reasons such as these, the Commission should not consider SBC's Broadband Wholesale Service offering as a viable alternative to unbundled end-to-end UNEs under this analysis.

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56 *UNE Remand Order* at ¶ 69; *see also IL Order* at p. 34.

57 *SBC/Ameritech Merger Order*, Appendix C at ¶ 12.

58 *Association of Communications Enterprise v. FCC*, -- F.3d --, Case No. 99-1441 (D.C. Cir. January 9, 2001) ("*D.C. Circuit Decision*").

59 *See Project Pronto Order* at ¶ 30; *see also IL Order* at 34.

It is self-evident that total replication of an ILEC's next generation loop network is not a viable alternative to unbundling.[61]

The FCC should find that the absence of unbundled end-to-end access to the ILEC next generation loop network architecture would materially diminish a requesting carrier's ability to provide service.[62] As required by FCC Rule 51.317(b), the cost, timeliness, quality, ubiquity, and impact on network operations of leasing dark fiber and collocating in each remote terminal requires such a determination.[63] Other factors such as promotion of the rapid introduction of competition; encouragement of facilities-based competition, investment, and innovation; or certainty to requesting carriers of access to next generation networks would further support such a determination by the FCC.[64] As a result, the "impair" standard requires the unbundling of next generation loop architecture for line sharing.

Cost. In determining whether the cost of self-provisioning or purchasing an element from a third-party source is materially higher than using the incumbent LEC's unbundled network element, the FCC has stated that all costs should be considered. Those costs may include costs that are above and beyond the direct costs of purchasing the element if they would be incurred by

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60 S*ee also Project Pronto Order* at ¶ 30; *see also IL Order* at 34.

61 *See also IL Order* at 34.

62 *See also IL Order* at 35.

63 47 C.F.R. § 51.317(b).

64 *See* 47 C.F.R. § 51.317(c).

requesting carriers using an alternative element to provide the services they seek to offer.[65] The FCC noted that these costs "are relevant to [its] determination of whether the element is a practical and economical alternative to the incumbent LEC's unbundled network element."[66] Some of these costs include fixed costs,[67] sunk costs (e.g., collocation costs),[68] and additional costs (such as interconnection costs).[69] The FCC stated that significant fixed and sunk costs associated with using alternatives to the incumbent's network contribute to a finding that lack of access to the incumbent's unbundled network elements impairs the requesting carrier's ability to provide the service it seeks to offer. Other relevant factors include the particular types of customers the carrier seeks to serve using the unbundled elements[70] and economies of scale enjoyed by incumbents as a result of their ubiquitous networks.[71]

It is indisputable that lack of unbundled access to an ILEC next generation loop materially increases a requesting carrier's cost of providing the service. In fact, not including all the other related costs associated with deploying an alternative network, the pure cost of collocating at each remote terminal dictates unbundling, because the cost of doing so would be astronomical.[72]

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65 *UNE Remand Order* at ¶ 72.

66 *UNE Remand Order* at ¶ 72.

67 "Fixed costs" are costs that do not vary with output. *UNE Remand Order* at ¶ 75.

68 "Sunk costs" are costs that once incurred , cannot be recouped if the firm ceases production. *UNE Remand Order* at ¶ 75.

69 *UNE Remand Order* at ¶¶ 75 & 76.

70 *UNE Remand Order* at ¶ 81.

71 *UNE Remand Order* at ¶ 84.

72 *IL Order* at 34.

The FCC stated that CLECs would be impaired in offering line sharing to the small business and residential market segments in part because of "the cost and delay of obtaining collocation in every central office where the requesting carrier provides service using unbundled loops."[73] Similarly, the collocation that would be needed to support an alternative network similar to an ILEC next generation loop would be materially greater than purchasing unbundled access to it.

As an additional corollary, when the FCC unbundled shared interoffice transport, it noted that "without access to incumbent's shared transport facilities, a requesting carrier must either deploy its own dedicated facilities or purchase dedicated transport from the incumbent."[74] The same rationale applies here. If a requesting carrier does not have access to the ILEC next generation loop, a requesting carrier's only option is to deploy its own facilities or purchase dark fiber from an ILEC. Moreover, the fact that customer demand is unknown at this time adds to the economic infeasibility of this alternative at this time.

Therefore, the Commission should conclude that unbundling of next generation loop architecture is appropriate because the relative costs for deploying an alternative network materially diminishes a requesting carrier's ability to provide services it seeks to offer.[75] Replicating an ILECs' next generation loop architecture would be prohibitively expensive and delay competitive entry.[76] Indeed, the FCC should find that the material costs and delays associated with self-provisioning a duplicate, ubiquitous network would impair a competitive

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73 *Line Sharing Order* at ¶ 30 (citing the *UNE Remand Order* at ¶ 306).

74 *UNE Remand Order* at ¶ 375.

75 *See also UNE Remand Order* at ¶ 355.

76 *See also UNE Remand Order* at ¶ 355.

LEC's ability to offer line sharing to a broad base of residential and small business customers. [77] Importantly, similar to the FCC's unbundling analysis for shared interoffice transport, the fiber transmission path will be "shared among many users" including an ILEC's end users, "thereby reducing requesting carrier costs and utilizing capacity only when necessary to route and complete a call."[78] These facts, by themselves, support a conclusion that unbundling is necessary here.

Timeliness. The FCC has concluded that "the time associated with using alternative elements is relevant to a determination of whether a requesting carrier would be impaired in its ability to provide the services it seeks to offer."[79] The FCC said that an assessment of timeliness is to be based upon "[a] thorough evaluation of the delays associated with using alternative elements [and] requires an analysis of both the start-up time required for a competitor to enter a market and serve a substantial number of customers in an MSA, as well as the time it would take a competitor that has already entered the market to expand its operations to serve more customers."[80] In general, the FCC held that "delays caused by the unavailability of unbundled network elements that exceed six months to one year may, taken together with other factors, materially diminish the ability of competitive LECs to provide the services that they seek to offer."[81] In arriving at this conclusion, the FCC noted that "incumbent LECs can take advantage of delays caused by the unavailability of unbundled network elements by using their unique access to most customers to

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77 *See also UNE Remand Order* at ¶ 355.

78 *UNE Remand Order* at ¶ 375.

79 *UNE Remand Order* at ¶ 89.

80 *UNE Remand Order* at ¶ 89.

81 *UNE Remand Order* at ¶ 89.

gain a foothold in new markets, and, in markets where services may be offered pursuant to long term-contracts (*e.g.*, DSL and other advanced data services), to 'lock-up' customers in advance of competitive entry."[82] Moreover, delays in the introduction of competitive services caused by the unavailability of unbundled elements from the incumbent LEC would give the incumbent valuable time to entrench itself with existing customers.[83]

The Commission should conclude that unbundling is appropriate under the timeliness factor because the lack of unbundled access to ILEC next generation loops on a platform basis would materially delay a requesting carrier's timely entry into the local market or alternatively delay expansion of an existing carrier's data service offerings.[84] Indeed, whether requesting carriers self-provision fiber, or purchase it from third-party providers, they must collocate their own equipment in ILEC remote terminals.[85] Thus, collocation is an essential prerequisite to self-provisioned and third-party provisioned fiber, and the time required to collocate affects a requesting carrier's ability to provide service using fiber.[86] This rationale, which was one of the FCC's primary reasons to unbundle dedicated transport, also applies here.[87] Moreover, these

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82 *UNE Remand Order* at ¶ 91.

83 *See UNE Remand Order* at ¶ 93.

84 *See also UNE Remand Order* at ¶ 361; *IL Order* at p. 34.

85 *See also UNE Remand Order* at ¶ 361.

86 *See also UNE Remand* at ¶ 361; *IL Order* at 34.

87 *See UNE Remand Order* at ¶ 361.

delays do not even contemplate the delays that may be caused by securing necessary access to rights-of-way, zoning or power supply that may be needed in certain instances.[88]

Quality. The FCC concluded that "the quality of alternative network elements available to the competitive LEC is relevant to a determination of whether a requesting carrier's ability to provide service is impaired" and that "a material degradation in service quality associated with using an alternative element will materially diminish a competitor's ability to effectively provide service."[89] The FCC also noted that:

> [e]xamples of diminished quality presented in the record include greater dialtone delay, higher blocking rates, elevated noise on a telephone line and increased failure rates. These types of quality problems, all of which are recognizable by the end-user customer may, taken together with other factors, materially diminish the ability of the competitor to provide the services that it seeks to offer. In addition, we believe that the type of service a competitor seeks to provide is also relevant to the quality factor. For example, end users may be much less tolerant of problems that affect data services, than they would be for voice service.[90]

The FCC should conclude that lack of unbundled access to the ILEC next generation loop on a platform basis will expose CLECs to material degradation in service quality associated with using an alternative element. Consequently, this degradation will materially diminish a competitor's ability to effectively provide service. In fact, there could be a degradation in throughput that is caused by the ILECs next generation loop.[91] These degradation concerns do

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88 *See UNE Remand Order* at ¶ 213.

89 *UNE Remand Order* at ¶ 96.

90 *UNE Remand Order* at ¶ 96 (footnotes and citations omitted).

91 *IL Order* at 35.

not even begin to contemplate the transmission quality of dark fiber, which may not be comparable to the transmission quality of the fiber used over an ILEC's next generation loop.

Ubiquity. The FCC also held that competitive LECs may be impaired if lack of access to an unbundled element materially restricts the number or geographic scope of the customers they can serve. In mandating consideration of the ubiquitous requirement, the FCC stated,

> It is … reasonable to expect that in some cases, the ability to serve ubiquitously will be necessary to meet consumer demand for competitive alternatives in broad geographic areas. It such cases, lack of access to the incumbent's unbundled network elements could significantly thwart the competitor's ability to respond to consumer demand. Denying access to the incumbent's unbundled network elements, when use of alternative sources would materially diminish the competitors' ability to serve their intended geographic area, would be inconsistent with the goal of the 1996 Act to bring competition to the greatest number of customers. Indeed, the inability to provide service ubiquitously may be especially important for competitive LECs seeking to serve residential and small business customers located throughout a state.[92]

The FCC should conclude that the limited availability of dark fiber and the need to collocate in remote terminals materially impairs a requesting carrier's ability to offer data services that traverse a fiber feeder over broad geographic areas.

Impact on Network Operations. When considering the impact of network operations, the FCC concluded that consideration be given to "how self-provisioning a network element or obtaining it from a third-party supplier may affect the technical manner in which the competitor can operate its network."[93] As the FCC stated, "[i]n order to compete with the incumbent,

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92 *UNE Remand Order* at ¶ 98 (footnotes and citations omitted).

93 *UNE Remand Order* at ¶ 99.

competitive LECs must be able to connect alternative elements either to their own networks or to other incumbent LEC elements that they use to provide service. Thus, material operational or technical differences in functionality that arise from interconnecting alternative elements may also impair a requesting carrier's ability to provide its desired services."[94]

The FCC should conclude that requesting carriers will be impaired if they do not have unbundled end-to-end access to ILEC next generation networks because CLECs will be unable to connect alternative elements to other incumbent LEC network elements that will be needed to provide various xDSL services over such facilities.

Other Factors to Weigh in the FCC Unbundling Analysis. In addition to the necessary and impair standards, other factors support the same conclusion that end-to-end unbundled access to the ILEC next generation loop is necessary.[95] The FCC should find that the end-to-end unbundling requested here (1) promotes the rapid introduction of data services in the residential and small business markets; (2) promotes competition, investment, and innovation for new advanced services; and (3) provides the certainty needed by requesting carriers require to provide data services throughout the network footprint.

For the foregoing reasons and based on the totality of circumstances considered as required by FCC Rule 51.317(b) & (c), the Commission should require that ILECs offer end-to-end unbundled access to next generation networks.

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94 *UNE Remand Order* at ¶ 99 (footnote and citation omitted).

95 47 C.F.R. § 51.317(c).